CERTIFICATE OF TRANSMISSION BY FACSIMILE (37 CFR 1.8) Applicant(s): **Klaus-Leo Wilbuer, et al.**			Docket No. **SWR-0056**
Application No. **09/856,816**	Filing Date **August 6, 2001**	Examiner **Greene**	Group Art Unit **3663**

Invention: **METHOD FOR PRODUCING A COATING FOR NEUTRONS PRODUCED IN NUCLEAR REACTIONS OF RADIOACTIVE MATERIALS**

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APPELLANT:	KLAUS-LEO WILBUER, ET AL.	) Before the Board) of Appeals
SERIAL NUMBER:	09/856,816	))
FILED:	August 6, 2001	))
FOR:	METHOD FOR PRODUCING A COATING FOR NEUTRONS PRODUCED IN NUCLEAR REACTIONS OF RADIOACTIVE MATERIALS	) Art Unit 3641)))

REPLY BRIEF

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I. STATUS OF CLAIMS

Claims 38-43 and 46 are pending in the application. Claims 38-43 and 46 stand rejected. Claims 44 and 48-58 are withdrawn from consideration. Claims 1-37 have been cancelled. Claims 38-43 and 46, as they stand, are set forth in Appendix VIII. Appellants hereby appeal the final rejection of Claims 38-43 and 46.

II. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 38-43 and 46 stand rejected under 35 U.S.C. § 102(b) as allegedly being unpatentable over Wang (United States Patent No. 4,238,299) (hereinafter "Wang"). Claims 38-43 and 46 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Wang in view of U.S. Patent No. 5,372,701 to Gerdon ("Gerdon"), U.S. Patent No. 4,865,645 to Planchamp ("Planchamp"), and applicants admitted prior art on Page 7 of the application. Claims 45 and 47 stand rejected under 35 U.S.C. § 103(a) as allegedly obvious over Wang in view of U.S. Patent No. 3,411,999 to Weinberg ("Weinberg").

III. ARGUMENT

A. Rejection of Claims 38-43 and 46 under 35 U.S.C. § 102(b). Claims 38-43 and 46 are patentable over Wang.

The present claims are directed to a method for producing a coating for absorption of neutrons comprising, inter alia, providing a dispersion bath comprising a "first substance having a high neutron capture cross-section" "wherein the first substance is in a form of an electrically conductive compound".

Wang discloses a method for producing shielding elements containing boron carbide particles embedded in a copper matrix. Wang clearly states that the boron carbide employed in the method is "electrically nonconductive boron carbide". (Col. 3, ll. 19-21) The idea that boron carbide is not electrically conductive is supported by the Appellant's specification in which it is noted that "Boron carbide offers only low conductivity, i.e. semiconductive characteristics at best". (p. 5, ll. 4-5)

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In the Answer, the Examiner states "While Wang does identify the boron carbide as being electrically nonconductive when combined with the copper ions the boron carbide in question is electrically conductive". (Examiner's Answer, p. 5)

Appellants respectfully point out that the claims are directed to an electrically conductive "compound". The present application, on page 6, identifies suitable electrically conductive compounds as iron boride and nickel boride. (ll. 13-14) As is known to one of skill in the chemical arts, a compound is "a substance whose molecules consist of unlike atoms and whose constituents cannot be separated by physical means". (McGraw-Hill Dictionary of Chemistry, p. 89, attached hereto as EXH. 1) A mixture, in contrast, is "is a chemical substance which is a homogeneous or heterogeneous association without chemical bonding of elements and/or compounds in varying proportions and that retain their own individual properties and makeup". (Wikipedia, attached hereto as EXH. 2) The Examiner refers to boron carbide combined with copper ions, however, this is clearly a mixture and not an elecrically conductive compound as required by the present claims.

Appellants further draw the Examiner's attention to claim 42 "wherein the electrically conductive compound of the first substance is a metallic compound" and claim 43 "wherein the electrically conductive compound of the first substance is metal boride". Wang discloses only boron carbide, which is not a metallic compound and is not a metal boride. Thus, claims 42 and 43 are clearly distinguishable from the boron carbide disclosed in Wang.

For at least the foregoing reasons, all of the limitations of Claims are not taught in Wang. Thus, the Examiner's rejection of Claim 38 under 35 U.S.C. §102(b) as being obvious over Wang is improper. Appellants respectfully request the reversal of the 35 U.S.C. §102(b) rejection of Claim 38 on these grounds. In addition, because claims 39-43 and 46 include all of the limitations of claim 38, these claims are also not anticipated by Wang. Appellants also request reversal of the rejection of claims 39-43 and 46 on these grounds.

B. Rejection of Claims 38-43 and 46 under 35 U.S.C. §103(a): Claims 38-43 and 46 are patentable over Wang in view of Gerdon, Planchamp, and Appellants' admitted prior art on page 7 of the Specification.

As described in detail above, Wang is missing the element of a first substance in the form of an electrically conductive compound. Gerdon, Planchamp, and Appellants' admitted prior art on page 7 of the Specification do not cure this defect, thus the disclosure of various electroplating metals, elements, and boron materials having high cross sections do not cure the defects of Wang. Wang, Gerdon, Planchamp, and Appellants' admitted prior art on page 7 of the Specification, alone or in combination, do not render the present claims obvious.

For at least the foregoing reasons, all of the limitations of independent Claim 38 and is not taught or suggested by Wang, Gerdon, Planchamp, and Appellants admitted prior art on page 7 of the Specification, either individually or in combination. Thus, the Examiner's rejection of Claim 38 under 35 U. S.C. §103(a) as being obvious over Wang in view of Gerdon, Planchamp, and Appellants' admitted prior art on page 7 of the Specification, is improper. Because Claims 39-43 and 46 depend from Claim 38, and because claims that depend from a claim that is non-obvious are themselves necessarily non-obvious, Appellants submit that Claims 39-43 and 46 are also non-obvious. Therefore, Appellants respectfully assert that the Examiner's rejection of Claims 39-43 and 46 is also improper. Appellants respectfully request the reversal of the 35 U.S.C. §103(a) rejection of Claims 38-43 and 46 on these grounds.

C. Rejection of Claims 45 and 47 under 35 U.S.C. §103(a): Claims 45 and 47 are patentable over Wang in view of Weinberg.

As described in detail above, Wang is missing the element of a first substance in the form of an electrically conductive compound. Weinberg does not cure this defect, thus the disclosure of reaction vessels and mixing methods is not relevant. Wang and Weinberg, alone or in combination, do not render the present claims obvious.

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For at least the foregoing reasons, all of the limitations of Claims 45 and 47 are not taught or suggested by Wang and Weinberg, either individually or in combination. Thus, the Examiner's rejection of Claims 45 and 47 under 35 U. S.C. §103(a) as being obvious over Wang in view of Weinberg is improper. Appellants respectfully request the reversal of the 35 U.S.C. §103(a) rejection of Claims 45 and 47 on these grounds.

D. Conclusion

For the reasons discussed above, Appellants respectfully submit that this application is in condition for allowance and requests reversal of the outstanding rejections and early allowance of this application. If there are any additional charges with respect to this Appeal Brief or otherwise, they may be charged to Deposit Account No. 06-1130.

Respectfully submitted,

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IV. CLAIMS APPENDIX

38. A method for producing a coating for absorption of neutrons generated in nuclear reaction of radioactive materials on a shielding element at least partly, the method comprising:

providing a shielding element having a base material and appropriately predefined surfaces;

providing a dispersion bath comprising a first substance having a high neutron capture cross-section and a second substance being electrolytically precipitable metallic wherein the first substance is in a form of an electrically conductive compound;

submerging said shielding element at least partly with appropriately predefined surfaces to be coated into said dispersion bath;

intermittently generating a relative movement between the respective surface to be coated and the dispersion bath during the coating process; and

removing the shielding element from said dispersion bath.

39. The method as set forth in claim 38, wherein the second substance is one element of the group that consists of nickel, cadmium and copper.

40. The method as set forth in claim 38, wherein the first substance is at least one of the elements of the group that consists of boron, gadolinium, cadmium, samarium, europium and dysprosium.

41. The method as set forth in claim 40, wherein the first substance is an isotope having an augmented neutron capture cross-section.

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42. The method as set forth in claim 38, wherein the electrically conductive compound of the first substance is a metallic compound.

43. The method as set forth in claim 42, wherein the electrically conductive compound of the first substance is metal boride.

45. The method as set forth in claim 38, wherein the relative movement is generated by blowing in a gas and/or by introducing ultrasound waves.

46. The method as set forth in claim 38, wherein the dispersion bath is thoroughly mixed at least periodically during the coating process.

47. The method as set forth in claim 38, wherein the process is performed in a ceramic or glass vessel.

V. <u>EVIDENCE APPENDIX</u>

EXHIBIT 1: Excerpt from McGraw-Hill Dictionary of Chemistry, 1997.

EXHIBIT 2: Definition of "mixture" from Wikipedia, http://en.wikipedia.org/wiki/Main_Page

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EXHIBIT 1

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Preface

The *McGraw-Hill Dictionary of Chemistry* concentrates on the vocabulary of those disciplines that constitute chemistry and related fields. With more than 8500 terms, it serves as a major compendium of the specialized language that is essential to understanding chemistry. The language of chemistry embraces many unique disciplines which are usually represented in specialized dictionaries and glossaries. Engineers, students, teachers, librarians, writers, and general readers of scientific literature will appreciate the convenience of a single comprehensive reference.

Terms and definitions in the Dictionary represent six fields: analytical chemistry, chemistry, inorganic chemistry, organic chemistry, physical chemistry, and spectroscopy. Each definition is identified by the field in which it is primarily used. When the same definition is used in more than one branch of chemistry, it is identified by the general field label [CHEMISTRY].

The terms selected for this Dictionary are fundamental to understanding chemistry. All definitions were drawn from the *McGraw-Hill Dictionary of Scientific and Technical Terms* (5th ed., 1994). Along with definitions and pronunciations, terms also include synonyms, acronyms, and abbreviations where appropriate. Such synonyms, acronyms, and abbreviations also appear in the alphabetical sequence as cross references to the defining terms.

The *McGraw-Hill Dictionary of Chemistry* is a reference that the editors hope will facilitate the communication of ideas and information, and thus serve the needs of readers with either professional or pedagogical interests in chemistry.

Sybil P. Parker
EDITOR IN CHIEF

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combustion train [ANALYTICAL CHEMISTRY] The arrangement of apparatus for elementary organic analysis. { kəm'bəs·chən ‚trān }

combustion tube [ANALYTICAL CHEMISTRY] A glass, silica, or porcelain tube, resistant to high temperatures, that is a component of a combustion train. { kəm'bəs·chən ‚tüb }

combustion wave [CHEMISTRY] **1.** A zone of burning propagated through a combustible medium. **2.** The zoned, reacting, gaseous material formed when an explosive mixture is ignited. { kəm'bəs·chən ‚wāv }

common cause [ANALYTICAL CHEMISTRY] A cause of variability in a measurement process that is inherent in and common to the process itself. { 'käm·ən 'köz }

common-ion effect [CHEMISTRY] The lowering of the degree of ionization of a compound when another ionizable compound is added to a solution; the compound added has a common ion with the other compound. { ¦käm·ən ¦ī‚än i'fekt }

common salt [INORGANIC CHEMISTRY] See halite; sodium chloride. { ¦käm·ən 'sölt }

comonomer [CHEMISTRY] One of the compounds used to produce a specific polymeric product. { ¦kō'män·ə·mər }

comparator [ANALYTICAL CHEMISTRY] An instrument used to determine the concentration of a solution by comparing the intensity of color with a series of standard colors. { kəm'par·əd·ər }

comparator-densitometer [ANALYTICAL CHEMISTRY] Device that projects a labeled spectrum onto a screen adjacent to an enlarged image of the spectrum to be analyzed, allowing visual comparison. { ¦kəm'par·əd·ər den·sə'täm·əd·ər }

comparison spectrum [SPECTROSCOPY] A line spectrum whose wavelengths are accurately known, and which is matched with another spectrum to determine the wavelengths of the latter. { kəm'par·ə·sən ‚spek·trəm }

compatibilizer [ORGANIC CHEMISTRY] Any polymeric interfacial agent that facilitates formation of uniform blends of normally immiscible polymers with desirable end properties. { kəm'pad·ə·bə‚līz·ər }

competing equilibria condition [CHEMISTRY] The competition for a reactant in a complex chemical system in which several reactions are taking place at the same time. { kəm'pēd·iŋ ‚ē·kwə'lib·rē·ə kən‚dish·ən }

complete combustion [CHEMISTRY] Combustion in which the entire quantity of oxidizable constituents of a fuel is reacted. { kəm'plēt kəm'bəs·chən }

complexation [CHEMISTRY] See complexing. { ‚käm‚plek'sā·shən }

complexation analysis [ANALYTICAL CHEMISTRY] The determination of the ligand/metal ratio in a coordination complex. { ‚käm·plek'sā·shən ə‚nal·ə·səs }

complexation indicator [ANALYTICAL CHEMISTRY] See metal ion indicator. { ‚käm·plek'sā·shən ‚in·də‚kād·ər }

complexation reaction [CHEMISTRY] A chemical reaction that takes place between a metal ion and a molecular or ionic entity known as a ligand that contains at least one atom with an unshared pair of electrons. { ‚käm·plek'sā·shən rē‚ak·shən }

complex chemical reaction [CHEMISTRY] A chemical system in which a number of chemical reactions take place simultaneously, including reversible reactions, consecutive reactions, and concurrent or side reactions. { 'käm‚pleks ¦kem·i·kəl rē'ak·shən }

complex compound [CHEMISTRY] Any of a group of chemical compounds in which a part of the molecular bonding is of the coordinate type. Also known as coordination complex. { 'käm‚pleks 'käm‚paùnd }

complexiametric titration [ANALYTICAL CHEMISTRY] See complexometric titration. { käm‚plek·sə¦me·trik tī'trā·shən }

complexing [CHEMISTRY] Formation of a complex compound. Also known as complexation. { 'käm‚plek·siŋ }

complexing agent [CHEMISTRY] A substance capable of forming a complex compound with another material in solution. { 'käm‚plek·siŋ ‚ā·jənt }

complex ion [CHEMISTRY] A complex, electrically charged group of atoms or radical, for example, $Cu(NH_3)_2^{+2}$. { 'käm‚pleks 'ī‚än }

complexometric titration [ANALYTICAL CHEMISTRY] A technique of volumetric analysis

in which the formation of a colored complex is used to indicate the end point of a titration. Also known as chelatometry. Also spelled complexiametric titration. { käm¦plek·sə¦me·trik ‚tī'trā·shən }

complex salt [INORGANIC CHEMISTRY] A class of salts in which there are no detectable quantities of each of the metal ions existing in solution; an example is $K_3Fe(CN)_6$, which in solution has K^+ but no Fe^{3+} because Fe is strongly bound in the complex ion, $Fe(CN)_6^{3-}$. { 'käm‚pleks 'sölt }

component [CHEMISTRY] **1.** A part of a mixture. **2.** The smallest number of chemical substances which are able to form all the constituents of a system in whatever proportion they may be present. { kəm'pō·nənt }

component-substances law [CHEMISTRY] The law that each substance, singly or in mixture, composing a material exhibits specific properties that are independent of the other substances in that material. { kəm'pō·nənt 'səb·stən·səs ‚lò }

composite sample [ANALYTICAL CHEMISTRY] A sample comprising two or more increments selected to represent the material being analyzed. { kəm'päz·ət 'sam·pəl }

composition [CHEMISTRY] The elements or compounds making up a material or produced from it by analysis. { ‚käm·pə'zish·ən }

compound [CHEMISTRY] A substance whose molecules consist of unlike atoms and whose constituents cannot be separated by physical means. Also known as chemical compound. { 'käm‚paùnd }

Compton rule [PHYSICAL CHEMISTRY] An empirical law stating that the heat of fusion of an element times its atomic weight divided by its melting point in degrees Kelvin equals approximately 2. { 'käm·tən ‚rül }

computational chemistry [CHEMISTRY] The use of calculations to predict molecular structure, properties, and reactions. { ‚käm·pyə'tā·shən·əl 'kem·ə·strē }

concave grating [SPECTROSCOPY] A reflection grating which both collimates and focuses the light falling upon it, made by spacing straight grooves equally along the chord of a concave spherical or paraboloid mirror surface. Also known as Rowland grating. { 'kän‚kāv 'grād·iŋ }

concentrate [CHEMISTRY] To increase the amount of a dissolved substance by evaporation. { 'kän·sən‚trāt }

concentration [CHEMISTRY] In solutions, the mass, volume, or number of moles of solute present in proportion to the amount of solvent or total solution. { ‚kän·sən'trā·shən }

concentration cell [PHYSICAL CHEMISTRY] **1.** Electrochemical cell for potentiometric measurement of ionic concentrations where the electrode potential electromotive force produced is determined as the difference in emf between a known cell (concentration) and the unknown cell. **2.** An electrolytic cell in which the electromotive force is due to a difference in electrolyte concentrations at the anode and the cathode. { ‚kän·sən'trā·shən ‚sel }

concentration gradient [CHEMISTRY] The graded difference in the concentration of a solute throughout the solvent phase. { ‚kän·sən'trā·shən ‚grād·ē·ənt }

concentration polarization [PHYSICAL CHEMISTRY] That part of the polarization of an electrolytic cell resulting from changes in the electrolyte concentration due to the passage of current through the solution. { ‚kän·sən'trā·shən ‚pō·lə·rə'zā·shən }

concentration potential [CHEMISTRY] Tendency for a univalent electrolyte to concentrate in a specific region of a solution. { ‚kän·sən'trā·shən pə'ten·shəl }

concentration scale [CHEMISTRY] Any of several numerical systems defining the quantitative relation of the components of a mixture; for solutions, concentration is expressed as the mass, volume, or number of moles of solute present in proportion to the amount of solvent or total solution. { ‚kän·sən'trā·shən ‚skāl }

concerted reaction [ORGANIC CHEMISTRY] A reaction in which there is a simultaneous occurrence of bond making and bond breaking. { kən'sərd·əd rē'ak·shən }

concomitant [ANALYTICAL CHEMISTRY] Any species in a material undergoing chemical analysis other than the analyte or the solvent in which the sample is dissolved. { kən'käm·ə·tənt }

condensable vapors [CHEMISTRY] Gases or vapors which when subjected to appro-

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EXHIBIT 2

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Mixture

From Wikipedia, the free encyclopedia.

A mixture is a chemical material of variable composition that contains two or more substances.

A **mixture** is a chemical substance which is a homogeneous or heterogeneous association without chemical bonding of elements and/or compounds in varying proportions and that retain their own individual properties and makeup. Mixtures can usually be separated by mechanical means.

There are no chemical changes in a mixture, i.e., each substance in a mixture keeps the same chemical properties and makeup as before. Physical properties of mixtures, e.g., the melting point, may considerably differ from those of its components. It usually does not.

Types of mixtures

- ***Homogeneous mixtures*** are mixtures that have a definite composition and properties, i.e., any amount of a given mixture has the same composition and properties. Examples are solutions and some alloys (but not all).
- **Heterogeneous mixtures** are mixtures without definite composition, for example, granite. Pizza is a typical humorous example of this kind of mixture. Heterogeneous mixtures are said to have several phases (not to be confused with phases of matter), i.e., parts of homogeneous composition that can be mechanically separated from the *rest*.

One type of a homogeneous mixture is a solution. In chemistry, a solution is a homogeneous mixture of one or more substances (the solutes) dissolved in another substance (the solvent). A common example would be a solid dissolving into a liquid, like salt or sugar dissolving in water (or even gold into mercury, forming an amalgam); but also gases may dissolve into liquids, like carbon dioxide or oxygen in water, and liquids and gases into themselves.

An ideal solution is one where the interactions of the molecules of the solvent with each other are equal to their interactions with the solutes. The properties of an ideal solution can be calculated by the linear combination of the properties of its components.

The solvent is conventionally defined as the substance that exists in a greater quantity than the solute(s) in the solution. If both solute and solvent exist in equal quantities (such as in a 50% ethanol 50% water solution), the concepts of "solute" and "solvent" become less relevant, but the substance that is more often used as a solvent is normally designated as the solvent (in this case, water).

Solvents can be broadly classified into polar and non-polar solvents. Common polar solvents include water and ethanol. Ethanol (C2H5OH) and other alcohols can be considered both polar and nonpolar as the OH end is polar (attracts polar molecules) and the hydrocarbon end is nonpolar (attracts nonpolar molecules). Generally polar or ionic compounds will only dissolve in polar solvents. A simple test for the polarity of a liquid solvent is to rub a plastic rod, to induce static electricity. Then hold this charged rod close to a running stream of the solvent. If the path of the solvent deviates when the rod is held close to it, it is a polar solvent.

When a solute is dissolved into a solvent, especially polar solvents, a structure forms around it (a process called solvation), which allows the solute-solvent interaction to remain stable.

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When no more of a solute can be dissolved into a solvent, the solution is said to be saturated. However the point at which a solution can become saturated changes significantly with different environmental factors, such as temperature, pressure, and contamination. Raising the solubility (such as by increasing the temperature) to dissolve more solute, and then lowering the solubility causes a solution to become supersaturated.

In general the greater the temperature of a solvent, the more of a given solute it can dissolve. However, some compounds exhibit reverse solubility, which means that as a solvent gets warmer, less solute can be dissolved. Some surfactants exhibit this behaviour.

There are several ways to measure the strength of a solution; see concentration for more information.

There are many types of solutions: Examples of solutions Solute Gas Liquid Solid Solvent Gas Oxygen and other gases in nitrogen (air) Water vapor in air (humidity) The odor of a solid results from molecules of that solid being dissolved in the air Liquid Carbon dioxide in water (carbonated water) Ethanol (common alcohol) in water; various hydrocarbons in each other (petroleum) Sucrose (table sugar) in water; sodium chloride (table salt) in water Solid Hydrogen dissolves rather well in metals; platinum has been studied as a storage medium Water in activated charcoal; moisture in wood Steel, duralumin, other metal alloys [edit]

See also

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* Colligative properties
* Colloid
* Making up solutions
* Molar solution
* Percentage solution
* Solubility equilibrium
* Soluble
* Suspension (chemistry)
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See also

- Separation of mixtures

<img src ="http://www.logosik.pl/images/crazyf_01.jpg">

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